Concordia
UNIVERSITY

Engineering & Computer Science BITS

FACULTY NEWSLETTER ◆ APRIL/ MAY 1996 ◆ VOLUME 3/ NUMBER 2

CBS hosts International Workshop

Workshop on the Quality of Indoor Environment in Confined Spaces a great success

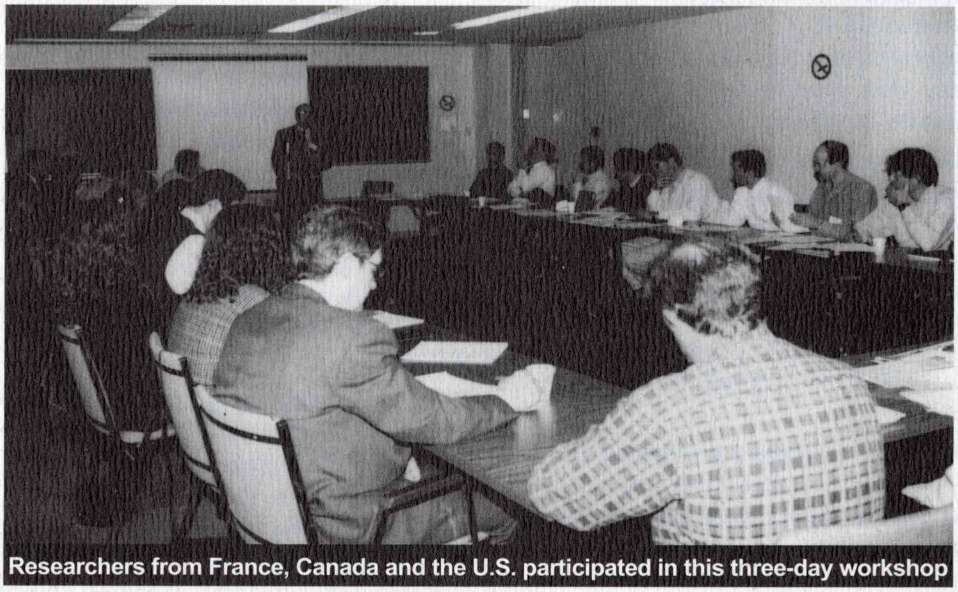
Concordia University's Centre for Building Studies (CBS) helped celebrate its 20th Anniversary with the opening of the International Workshop on the Quality of Indoor Environment in Confined Spaces - Thermal Comfort, Ventilation and Air Quality. The workshop, which took place from April 29 to May 2, was a collaborative effort between Concordia's Faculty of Engineering and Computer Science, La conférence des grandes écoles de France and the National Committee of Deans of Engineering and Applied Sciences.

A total of 35 researchers from France, Canada and the U.S. representing research centres, universities, and private-sector enterprises participated in this three-day event. Representatives from Canada's provincial and federal ministries of Energy were also on hand.

The main purpose of the event was to help exchange and assess the state of present knowledge within the indoor environment field as well as help define new research directions and establish new research projects in collaboration with French and American researchers.

Workshop topics focussed on Thermal Comfort, air quality, building ventilation, applied numerical modelling in confined spaces as well as industry needs relating to the quality of interior environments and energy efficiency in buildings.

Workshop formats consisted of an introductory presentation highlighting the latest research developments on each of the workshop topics, followed by a round table discussion. At the end of each day time was alloted for the development of small discussion groups, initiated by the invited researchers, to help promote potential collaborative research projects.



Researchers from France, Canada and the U.S. participated in this three-day workshop

As a direct result of these discussions no less than eight research projects were proposed in collaboration with France and the United States. These projects included:

- ◆ the development of the SPARK program (a user-friendly interface program which allows for simple application of mathematical models) to be linked with the DOE program (an energy analysis program for buildings)
- ◆ Heat and mass transfer in building envelopes
- ◆ Analysis of the potential impact of electrochromic glazings
- ◆ Development of a library of software modules to be used in energy analysis, indoor air quality and thermal comfort
- ◆ Control of HVAC systems
- ◆ Building materials emission

Dr. Radu Zmeureanu co-organizer of the workshop and professor at Concordia's Centre for Building Studies indicated that the research efforts focussing on these areas by Canada, the U.S. and France would be developed extensively over the next few months and hopes to have concrete project ideas in place by the end of the summer in order to begin implementation. He further hopes that this collaborative effort will improve the chances of obtaining government and/or industry grants. According to Dr. Zmeureanu a workshop will be scheduled in France two years from now where the completed projects will be fully examined.

The workshop was made possible thanks to the support of France's Ministry of Foreign Affairs and Ministry of Research as well as from the Mission Scientifique de l'Ambassade de France au Canada, Concordia's Faculty of Engineering and Computer Science and the Natural Resources Ministry of Quebec.

For further information regarding the workshop please contact Dr. Zmeureanu at (514) 848-3203 or via e-mail at zmeur@cbs-engr.concordia.ca

CFD Lab seeks to collaborate with Italian Aerospace Industry

CIRA and CRS4 a source of tremendous opportunity for Quebec Aerospace Consortium

Last March Dr. W.G. Habashi, Director of Concordia's Centre for Computational Fluid Dynamics (CFD lab) and Dr. Donat J. Taddeo, Dean of the Faculty of Engineering and Computer Science, were invited to join a Quebec Aerospace mission to Italy in an effort to help promote collaborative research projects between the Italian aerospace industry and universities and their counterparts in Quebec.

The Quebec consortium, which was assembled by the Quebec Ministry of International Relations, also included representatives from SPAR Aerospace and four other companies as well as Dr. Renato Bosisio from École Polytechnique.

The Italian Aerospace initiative has been requesting the aid of external parties to assist them in accelerating their research efforts as well as risk sharing. In particular, the CFD Lab could lend its expertise in such projects as: In-flight ice formation on aircraft, the simulation of flows in gas turbine engines as well as the performance evaluation of aircraft.

The consortium first met with the Italian Air Industries Association which was comprised of representatives from Italy's numerous Aerospace companies. Presentations were made by the CFD's Dr. Habashi on behalf of large and small aerospace companies based in Montreal. The list included: CFD Lab, Bombardier/Canadair, Pratt & Whitney, SPAR Aerospace, Rolls Royce Gas Turbine Engines, MDS, Realix, Centre Technologique en aérospatiale, CAE Electronics, Bombardier Military and Institut des matériaux industriels du CNR.

Both Concordia delegates were then invited to the prestigious University of Roma La Sapienza where Dr. Taddeo made a presentation highlighting the Faculty of Engineering and Computer Science while Dr. Habashi directed a seminar on adaptive techniques in computational aerodynamics.

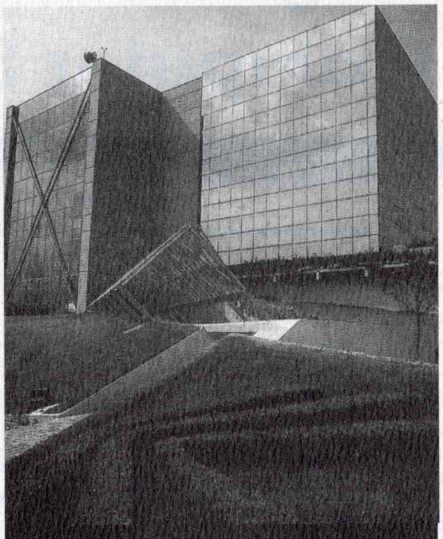
Dr. Taddeo and Dr. Habashi then traveled to Napoli where presentations were made to a group headed by the Director of the Italian Centre for Aerospace Researchers (CIRA), the Director of the Mechanical Engineering department of the University of Napoli and the Director of Aerodynamics for Alenia, the largest aircraft manufacturer in Italy.

CIRA, a joint-stock consortium company, was incorporated in 1984 by major Italian Aerospace companies and the Campania Region and serves as Italy's National Aerospace Research Centre. Dr. Habashi noted that while Canada and the U.S. are downsizing their National Research Labs (NRC in Ottawa and NASAs across the U.S.) Italy has been pouring 600 million Canadian dollars over the last three years into CIRA. Even now, they are building a state-of-the-art icing tunnel used to measure ice buildups and its effects on aircraft and their engines. In fact, CIRA is presently looking for a partner with whom to develop computer simulations to complement the testing of the ice tunnel. The fact that CFD research can and has helped them in developing this tunnel could translate into further collaboration on this project. CIRA is also interested in the Adaptive Mesh Techniques of the CFD Lab-GIREF (Université Laval) used to obtain high precision in computational flow dynamics.

The final leg of the trip took place in Sardenia where presentations were made to the Director and members of the Centre for Advanced Studies, Research and Development in Sardenia (CRS4). The Sardinian government has created a state-of-the-art computational methods research centre operating in the fields of advanced simulation models for the solution of large-scale computational problems, multimedia, scientific visualisation and high speed networking. The centre itself receives annual government funding of $12 million dollars.

Collaborative agreements were proposed in the areas of Gas Turbine Simulation, adaptive methods and solution methods for large-scale CFD problems. According to Dr. Habashi the CFD Lab plans to apply with CRS4 and CIRA to the Quebec-Italy Research Program and has already, within that same program, applied for a post-doctoral fellow.

Discussions are continuing in Montreal and Dr. Taddeo along with Dr. Bosisio (École Polytechnique) are assembling a Quebec consortium to collaborate with an Italian consortium of Universities on numerous projects. The Italian consortium will be applying shortly for research grants and both École Polytechnique and the CFD Lab will be assisting them in this matter.

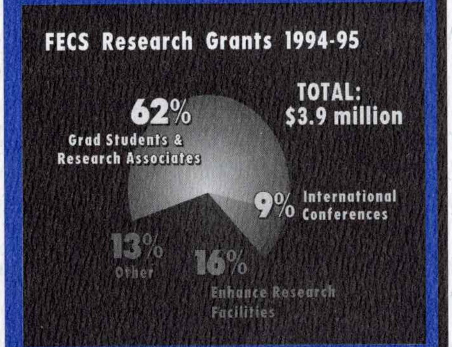


The Italian Centre for Aerospace Research in CAPUA

Dr. Habashi pointed out that many of the programs available between Quebec and Italian research centres and universities were initiated by Dr. Taddeo, when he had acted as Quebec's delegate to Italy from 1988 to1992.

For further information regarding these discussions please contact Dr. W.G. Habashi at (514) 848-3165 or via e-mail at habashiw@cfdlab.concordia.ca

Did You Know ?



Last year the Faculty of Engineering & Computer Science generated $3.9 in research revenue which went directly to fund grad students and research associates, enhance research facilities as well as enable professors to share the results of their research through participation at International Conferences

CONCOM Director S.V. Hoa Awarded Technology Partnership Program Grant

Centre for Composites to collaborate with CPF Dualam on development of corrosive-resistant tanker

Concordia's Centre for Composites was recently awarded a $679,000 Technology Partnership Program (TPP) grant from the Natural Sciences and Engineering Research Council of Canada (NSERC). The TPP is the newest grant developed within NSERC's University-Industry Projects division and supports partnerships between universities and small and medium-sized Canadian companies to develop university research to the point where it can be exploited and commercialized by industry.

Dr. S.V. Hoa, director of the Centre for Composites (CONCOM) became the first and only Concordia professor to receive such a grant and explained that the TPP differs from other NSERC grants in that a concrete product must be developed which can be sold on the commercial market. In this case the product is a self-supporting road tanker which will have a wall structure of Fibre Reinforced Plastic (FRP) with a thermoplastic liner inside. The goal is to develop a cost-effective, anti-corrosive and multi-purpose tanker capable of transporting highly toxic and corrosive materials.

There are three features that distinguish the proposed tanker to be developed from those already used on the market. First, the thermoplastic liner contained within the tanker has better resistance to solvent attacks than the currently-used veil liners. Second, the incorporation of a leak detection system. Suprisingly, there are currently no leak detection systems used in existing tankers of this nature (something to think about the next time you're driving next to one of them on the highway). Finally, from a structural stand-point, the technology used to develop the tanker will have superior integrity and will be less labour-intensive to produce than existing models.

CPF Dualam Inc., a Montreal-based company and technological leader and pioneer in the field of dual-laminate vessels, will be collaborating with the Centre for Composites in this three-year project (1996-1999). Production will be accomodated using the company's current manufacturing facilities.

The impact of the successful completion of this project is multi-faceted. From a company perspective, this project will help create close to 25 new jobs as well as ensure job security for another 30 positions. The environmental impact is equally significant since the product will provide a safer means of transporting hazardous materials. From a safety standpoint, the tanker would reduce the level of risk in the transportation of corrosive liquids thanks to its anti-corrosive nature and leak detection systems. Finally, as a new concept for the fabrication of tanker products, this project will put Canada at the forefront in the design, analysis and fabrication of polymer composite structures for tanker products.

The Centre for Composites will develop software which incorporates tanker design technology as well as provide the company with training for software usage. CONCOM will also transfer new production techniques to CPF Dualam on an on-going basis throughout the project.

Dr. Hoa, the principal researcher in this project, has been working on composite materials and structures since 1979 in the fields of design, manufacturing as well as destructive and non-destructive testing. He is the author and co-author of numerous publications relating to the study of composite materials and is the founder of the Canadian Association for Composite Structures and Materials.

For further information regarding this project please contact Dr. S.V. Hoa at (514) 848-3139 or via e-mail at hoasuon@vax2.concordia.ca

Agreement of Cooperation reached between India and Concordia

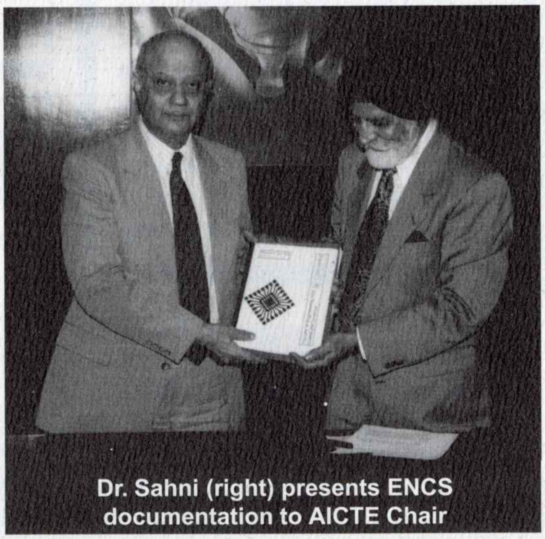
All India Council for Technical Education expresses interest in collaborating with Concordia's Faculties of Engineering & Computer Science and Arts & Science

On a recent trip to India Dr. Balbir Sahni, Director of Concordia's Centre for International Academic Cooperation, signed an agrement of cooperation between Concordia University and the All India Council for Technical education (AICTE). The agreement itself calls for the promotion of collaborative research and exchange of Faculty between Concordia and Indian Universities. An emphasis was placed on the areas of mutual interest in University and Industrial interaction as well as joint research and doctoral programmes.

Prior to signing this important linkage agreement Dr. Sahni met with both Dean Donat J. Taddeo from the Faculty of Engineering and Computer Science, Dean Valaskakis from the Faculty of Arts and Science as well as Dr. Jack Lightstone, Concordia's Vice-Rector. It was mutually agreed that this collaborative effort would prove beneficial to both parties involved.

The AICTE , among other information, received documentation on the Faculty of Engineering and Computer Science and indicated that there was great potential for establishing joint training and research programs with the Faculty.

Dr. S.K. Khanna, chairman for the AICTE was extremely impressed with ENCS research centres, facilities and the overall content of its academic program. Both parties expect that funds will be set aside within their respective budgets to help facilitate this exchange and may jointly apply for funding from the Canadian International Development Agency (CIDA).



Dr. Sahni (right) presents ENCS documentation to AICTE Chair

1995 EXTERNAL ADVISORY BOARD

The Faculty's External Advisory Board was formed in response to the current need to forge closer and multi-level links among academia, industry and government. Its role is to provide insight and guidance as the Faculty develops both short and long term strategic plans for the future.

The EAB consists of an Executive Committee and five departmental working groups, one affiliated with each of the five academic units within the Faculty. *Working group leaders' names are in bold.*

PRESIDENT

M. Bachynsky
MPB Technologies Inc.

Terms of appointment shall be for three years. Members will serve on the Board for no more than two terms. Both President and Vice-President will serve for two years on the committee.

DEAN

D.J. Taddeo
Faculty ENCS

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P. Fazio *Director CBS*	M. El-Badry *Chair Civil*	C. Lam *Chair Computer Science*	J.C. Giguère *Chair ECE*	S.V. Hoa *Chair Mechanical*

SAE Team gearing up for 1996 FutureCar Challenge

Final technical inspection takes place this week before Competition in Detroit on June 17

Members of Concordia's Society for Automotive Engineers (SAE) are in the final preparatory stages leading to the 1996 Performance evaluation of its FutureCar Challenge competition entry in Dearborn, Michigan.

The two-year competition, aimed at designing and building a mid-size passenger car capable of achieving up to 80 miles per gallon, is sponsored jointly by the U.S. Department of Energy and the United States Council for Automotive Research (USCAR)- a research venture of Chrysler Corporation, Ford Motor Co., and General Motors. Participants must achieve this fuel efficiency standard while also maintaining the price, performance, manufacturability and consumer acceptability of cars currently available on the market.

An initial inspection of Concordia's facilities and vehicle by FutureCar Challenge representatives took place last February and will be followed-up by a second inspection on May 15. However, According to Dr. Tadeusz Krepec, Faculty Advisor for the SAE, this second inspection will be far more technical than its predecessor. The first inspection was more of an introduction to the Faculty and its facilities and a very "general" overview of the team's vehicle was presented. This upcoming inspection will closely examine the team's car to ensure that it conforms to the specified technical norms of the competition and that it will be up to par for competition testing in June. This will allow the team to make adjustments to their car based on feedback from inspectors.

Week-long design and performance competitions will take place from June 17-24 where teams will put their vehicles to the test in the areas of acceleration, slope performance, braking and maneuverability. There will also be a 250 mile rally around Michigan to measure vehicle performance and fuel efficiency under random driving conditions.

Similar competitions will also take place in June of 1997 where teams will use feedback from this year's evaluations to improve their respective vehicles. Awards will be given both in 1996 and 1997.

For further information regarding this and other SAE events please contact Dr. T. Krepec at (514) 848- 3151 or via e-mail at mecheng@vax2.concordia.ca

PROFILE *Dr. John Campanelli*

Civil's newest Professor helps strengthen Concordia's Environmental Engineering Program

The Faculty of Engineering and Computer Science would like to introduce Dr. John Campanelli, newest member of the Faculty's Civil Engineering Department and environmental engineering specialist. Dr. Campanelli joins Dr. Maria Elektorowicz and Dr. Jean Drolet as part of Concordia's Environmental Engineering team.

Receiving his Bachelor's, Master's and PhD degrees in Chemical Engineering from McGill University, Dr. Campanelli's research focussed primarily on developing novel recycling methods for waste plastics. After completing his Master's, Dr. Campanelli worked at Dupont in Kingston, Ontario as a research scientist examining methods for plastic recycling. He returned to his Alma Mater to complete his PhD thanks to funding from NSERC as well as a Fellowship awarded him from Hydro-Québec.

As part of his post-doctoral work, Dr. Campanelli worked for vinyl flooring specialists Domco Inc. on a two-year project which focussed on replacing solvent-based coatings with environmentally-friendly water-based coatings. Upon completion of this project Dr. Campanelli was hired by Concordia University in July, 1995 where he applied concepts from his research at Domco to soil remediation techniques involving the use of surfactants. As Dr. Campanelli explained, surfactants are molecules that are attracted to surfaces or interfaces between two phases (i.e. oil and water). Surfactant application in soil remediation is Dr. Campanelli's current research area at Concordia University and is vital to soil remediation in that it would facilitate the separation of pollutants from soil. More specifically, his research focusses on the use of biological rather than synthetic surfactants since the latter can be toxic and consequently harmful to microorganisms found in soil. Dr. Campanelli was awarded an NSERC grant for his research in this field.

Regarding the development of Concordia's Interfaculty Environmental Lab in collaboration with ecotoxicology, Dr. Campanelli feels that this initiative will increase the possibility for collaboration between Concordia and other Montreal-area Universities (McGill/ Polytéchnique/ UQAM/ U of M) as well as industry. The lab will be extremely well-equipped and will offer state-of-the-art technology thanks to NSERC equipment grants received by both himself and Dr. Elektorowicz. Dr. Campanelli stated that both Dr. D.J. Taddeo, Dean of the Faculty of Engineering and Computer Science, and Dr. Perry Anderson , Director of eco-toxicology, were indispensable in the development of this unique facility.

He also considers the creation of the Interdisciplinary Group for Environmental Impact Studies (IGEIS) with ecotoxicology, geology and economics to be a positive initiative. Dr. Campanelli stated that there is good synergy among the groups and that this initiative will help foster the development of new ideas. He also believes that Concordia can become a leader in this form of interdisciplinary collaboration

Dr. Campanelli's research has appeared in the Journal of Applied Polymer Science, and the Canadian Journal of Chemical Engineering as well as in the Conference proceedings of the Society of Plastics Engineers and the Canadian Society of Chemical Engineers. He is presently on the first year of a three-year contract as Assistant Professor with Civil Engineering.

1996-97 NSERC Grants Awarded

NSERC grants for the 1996-97 academic year were announced at the beginning of April. The following is a breakdown of the number of grants received and the total amounts awarded per academic unit. Note: Conditional grants are not included.

ACADEMIC UNIT	OPERATING GRANTS #	$	EQUIPMENT GRANTS #	$	TOTAL #	TOTAL $
CBS	6	146 500	--	---------	6	146 500
CIVIL	3	62 540	2	149 224	5	211 764
COMPUTER SCIENCE	8	198 000	1	63 000	9	261 000
ECE	10	233 242	--	---------	10	233 242
MECHANICAL	7	164 575	1	92 450	8	257 025
FACULTY TOTALS	34	804 857	4	304 674	38	1 109 531

Computer Science Seminars

The Department of Computer Science will be hosting two seminars in LB-922-4. All are welcome.

1st seminar: Friday May 24, 1996 10:00 a.m.
Speaker: **Dr. D. O'Leary**
University of Southern California
Topic: **The relationship between errors and system size in KBS**

2nd seminar: Monday June 10, 1996 2:00 p.m.
Speaker: **Dr. Markus Hofmann**
Institute of Telematics,
University of Karlsruhe
Topic: **Scalable Protocol Support for Multicast Communication**

FACULTY NEWS

Centre for Building Studies

Dr. Richard Guy obtains contract with Bombardier

Dr. Richard Guy was awarded a $ 22 000 dollar contract on behalf of Bombardier and its Canadair division for a project aimed at designing lighter aircraft. Using the intensity-based sound transmission loss measurement test facility to test the level of sound blocked by their aircraft panels, Dr. Guy revealed that airplane manufacturers can create equally soundproof aircraft that perform as well as the traditionally heavier models being manufactured today. This project may lead to another similar contract with Bombardier Lear Jet, an American division of Bombardier.

Electrical and Computer Engineering

Dr. J.F. Hayes Honoured

The Canadian Information Theory Society (CITS) honoured Dr. J.F. Hayes with the 4th Canadian Award in Telecommunications Research at the Queen's University Biennial Symposium on Communications. For over 30 years, Dr. Hayes has conducted research in the field of telecommunications at institutions such as Bell Telephone, McGill University and now Concordia, where his primary research activity focusses on telecommunications systems.

Department of Civil Engineering

Establishment of IGEIS with Ecotoxicology

An interdisciplinary group for Environmental studies (IGEIS) was established between Civil's Environmental engineering program and ecotoxicology. This initiative allows both disciplines to share and collaborate in the area of research and will help maximize the use of research facilities within the University. IGEIS will also incorporate the already existing Interfaculty Research complex presently shared by Civil engineering and ecotoxiclogy as a base of operations

For additional information please contact Dr. Maria Elektorowicz at (514) 848-7805

Dr. El-Badry appointed Project Leader for ISIS Canada

Dr. M. El-Badry was appointed project leader within ISIS Canada (Intelligent Sensing for Innovative Structures), one of the country's networks of centres of excellence. More specifically, Dr. El-Badry will be leading research groups on the use of advanced composite materials in bridges and structures.

General Announcement

Faculty-Sponsored Students Win at International Science & Engineering Fair (ISEF)

Last weekend three Montreal students returned home with major awards from the 47th International Science and Engineering Fair (ISEF) in Tucson, Arizona which attracted over 1,000 students from 40 different countries. Eric Bellotti (4th prize- $500 Intel foundation), Sabrina Perri (1st prize- $5,000 Intel foundation) and Tejas Sankar (3rd prize- $1,000 Intel foundation) were part of Team Canada '96, a group of twenty top science fair winners from across Canada organized by the Youth Science Foundation Canada and sponsored in part by several Canadian Universities, including Concordia's Faculty of Engineering and Computer Science who presented a $3000 travel expense award to the winners of the Bell Montreal Regional Science Fair to subsidize their trip to Tucson.

For further information please contact Dr. Rocco Iafigliola at (514) 931-8792 or via FAX at 931-8790

Department of Mechanical Engineering

Dr. Bulgak Receives Major Grant from CIDA for Chinese Projects

The Advanced Manufacturing Technologies Program developed by Dr. A.A. Bulgak has been awarded a major grant from the Canadian International Development Agency (CIDA). The grant was awarded in conjunction with the Ministry of Foreign Trade and Economic Cooperation of China, the Association of Universities and Colleges of Canada (AUCC) and the Chinese State Education Commission. The program's five-year mandate in China includes laboratory, library and program development, and the creation of a manufacturing resource centre for problem-solving and on-site solution strategies.

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BITS welcomes submissions from the members of the Faculty community

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